Meteorological	record at	Hill Gardens,	Jamaica.
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Pressure.			Temperature.		Dew Rel		Rela	tive	lon.	Wind.					
	<del></del>		1			DOING.		numicity.		Direction.		Move- ment.			
August, 1897.	7 a. m.	8 p. m.	7 a. m.	8 p. m.	Maximum.	Minimum.	7 a. m.	8 р. т.	7 a. m.	8 p. m.	Precipitation.	8 p. m.	7 a. m.	Sp.m. to 7 a. m.	7 a.m. to 8 p. m.
1 8 9 10 11 12 12 13 14 15 14 15 19 20 22 22 22 22 22 22 22 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 23 2	85.85.80 4 4 4 4 4 8 8 4 5 8 5 8 8 8 8 8 8 8 8 8	25.85 25.36 25.47 25.41 25.86 25.41 25.86 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40 25.40	63 64 65 66 66 62 62 62 62 63 64 64 64 64 64 64 64 64 64 64 64 64 64	66 68 68 73 69 7 68 77 75 69 68 77 75 69 68 77 75 69 68 77 75 69 68 68 68 68 68 68 68 68 68 68 68 68 68	69 70 72 74 76 75 70 78 77 76 77 76 77 76 77 77 76 77 77 77 77	58 58 60 60 59 61 60 58 60 61 59 60 61 58 61 59 60 61 58 61 59 60 61 58 61 60 61 58 61 60 60 60 60 60 60 60 60 60 60 60 60 60	61 58 57 62 62 58 58 58 57 62 58 58 58 58 58 58 58 58 58 58 58 58 58	623 624 646 650 644 556 655 615 655 655 655 655 655 655 655	96 677 80 1817 877 8787 8787 878 886 886 8879 888 889 886 8878 886 8878 8878	87 811 87 87 81 81 87 87 87 87 87 88 87 88 87 88 87 88 87 88 88	0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00	50. 60. 60. 60. 50. 50. 50. 50. 50. 50. 50. 50. 50. 5	50. 50. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 85. 85. 85. 85. 85. 85. 85. 85.	285 5 5 5 5 100 155 50 155 50 150 5 5 150 150	10 5 0 5 5 5 5 0 4 4 80 0 10 25 5 5 10 0 5 10 0 5 10 0 5 15 0 0 0 0 5 5 5 0 0 0 0
01	25.405	25.393							88	81	5.38	ese.	ese.	46.7	8.6

## FORMS OF LIGHTNING.

In his meteorological essays, Arago collects and classifies the descriptions of the different forms that lightning assumes. The first class consists of narrow, thin, sharply-defined, luminous lines which may have crimson, violet, or bluish colors. These lines may be classified as straight or slightly curved, zigzag or broken lines, greatly curved and even reentrant, and, finally, forward and return, very nearly resembling the capital letter V. We have also single flashes that bifurcate into a collection of smaller flashes that may number anywhere from two to one hundred, the double and triple forks being least frequent. To these varieties the Editor would add a sinuous form of lightning flash that he has seen on several occasions, both in Chicago and Washington, in which the flash appears to run with comparative slowness, horizontally, along the under surface of a cloud, dying out after it has pursued a path whose apparent angular length is from one to five degrees. No noise whatever usually accompanies this lightning, although the flashes may be in the zenith. When last observed, in May, 1897, it seemed possible that these might be simply long flashes viewed endwise, so that the apparent path, which was sometimes so curved as to form a complete oval or spiral, was simply the projection of what would from another location have appeared to be a long flash between an upper and a lower cloud.

The second class recognized by Arago is that of the diffuse lightning, spreading over immense surfaces, often of an intense reddish tinge, but sometimes blue or violet, and which in America and England are spoken of as "heat lightning," but which are more properly called "sheet lightning." During an ordinary thunderstorm the sheet lightning is far more frequent than the flash lightning.

The third class includes the mysterious "globular or ball lightning" which rolls about on the ground and has thus far defied all attempts at satisfactory explanation.

As a fourth form of electric discharge we must reckon the continuous emission of light from the surface of certain northeast, c miles from the east, etc. The north and south clouds. As these clouds are low, and as the light dies away movements partly offset each other, so also the northeast and after a few minutes only to be renewed again after a short southwest, the east and west, the southeast and northwest,

interval, we must consider this light as due to myriads of little flashes between the particles of the clouds without appreciable noise.

Besides the lightning interchanged between the clouds, or the clouds and the earth in ordinary weather, a still more interesting fifth class should be made of those that play between the earth and the cloud of ashes and vapor formed

above a volcano in active eruption.

There does not seem to be any evidence that in these five classes there is any special new production of electricity. have only to consider the earth as the electrified body, permanently electrified and always, by induction, inducing electric manifestations in every substance that is near to it. The auroral light ought to be included as one form of the lightning discharge, since it is certainly a form of electric discharge modified by the rarity of the upper atmosphere from the flash to the stratified sheet lightning. The electric discharge is modified, not merely by the rarefaction of the dry atmosphere of oxygen and nitrogen, but still more so by the rarefaction of the other gases in the atmosphere, such as the hydrocarbons and the carbonic acid gas, and probably also by that of the aqueous vapor, so that air, which is very dry or very cold, and therefore contains but little aqueous vapor, may have much to do with the formation of auroras. According to the recent researches of Professor Trowbridge, the character of the electric current as to intensity and quantity is also a prime factor in determining the character of the luminosity. He has been able to reproduce a great variety of forms of lightning, such as have been photographed from time to time by proper alterations in his apparatus.—[C. A.]

## RESULTANT AND PREVAILING WINDS.

In response to a request from Mr. Fred. A. Tower, voluntary observer at Concord, Mass., the Editor submits the following note with reference to the meaning and the method of deducing the resultant and the prevailing winds.

The resultant may be conceived of as computed by either one of two different methods. Both give the same resultant but suggest very different interpretations as to what that resultant means. In the first method, the observer plots upon a sheet of paper the wind movement, as to its length and direction, for the first hour; at the end of that line as a starting point he plots the motion for the second hour, and at the end of that the motion for the third hour, and so on. His sheet of paper soon becomes covered with a very irregular broken line and if at any moment he stops this process and draws a heavy straight line from the start point to the end point, this will represent, both in length and direction, the resultant wind. When constructed in this way, under the implied assumption that the individual observed winds are all horizontal motions, the diagram accords with the idea that a particle of air has actually followed this irregular broken line, and has finally arrived at its end point just as a vessel, sailing irregularly in all possible directions, must finally arrive at a spot that represents the resultant of its efforts to sail in a straight line. Such diagrams and such an interpretation are perfectly proper for vessels on the ocean, and especially for plotting ocean currents by means of floating wrecks, but the interpretation is not proper in the case of the wind because it is probable that a particle of air never pursues a horizontal movement for any long period of time.

The second method of computing the resultant consists in classifying all the movements according to the direction in which they occurred, and summing them up so that we have, as a grand total, a miles from the north, b miles from the